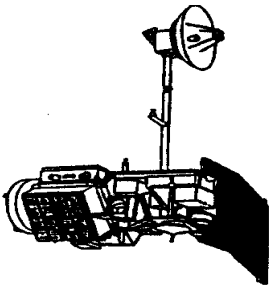


LANDSAT 5

Land Satellite 5

Spacecraft Sketch	Mission Objective
	<p>The Land Satellites 4&5 (Landsat 4&5) project is an experimental NASA project designed to determine the utility of satellite-acquired multispectral earth resources data for management of environment and natural resources. Each spacecraft carries the powerful remote sensing capabilities of the Thematic Mapper (TM). The supporting ground system is a complete end-to-end highly automated system that is a major improvement in global remote-sensing applications. The specific mission objectives are to: 1) assess the capability of the TM to provide information for Earth resources management; 2) provide for system-level feasibility in concert with user agencies to define the need for and characteristics of an operational system; 3) encourage continued foreign participation in studies of environmental and natural resources; 4) provide a transition for both domestic and foreign users from MSS data to the TM with a higher resolution and data rate.</p>

TYPE OF MISSION	PROGRAM OFFICE	PROJECT LEAD CENTER	MANAGEMENT APPROACH	S/C CONTRACTOR	I&T CONTRACTOR
EARTH SCIENCES & APPLICATIONS	SPACE & TERRESTRIAL APPLICATIONS	GSFC	OUT-OF-HOUSE	GE	GE

Payload Description
<p>The Land Satellites (Landsat 4&5) include an Instrument Module (IM), which accommodates and supports a Thematic Mapper (TM) and a Multispectral Scanner (MSS), and a Multi-Mission Modular Spacecraft (MMS). Also included for the first time in a NASA satellite is a Global Positioning System (GPS), which uses data from navigation satellites to calculate the spacecraft position and velocity. The IM includes mission unique structure and subsystem items of mission unique equipment. The MMS spacecraft are follow-ons to the MMS that initially flew as SMM. Spacecraft power is generated by a mission unique solar array, which is a deployable system of four flat panels. Transmission of sensor data is performed in a variety of bands, both directly to ground stations and using the Tracking and Data Relay Satellite System. Precision attitude control is achieved with an inertial reference unit, using updated data from two star trackers. The MMS propulsion module enables orbital altitude to be varied for repeat ground swath coverage and possible Shuttle rendezvous.</p>

INSTRUMENT NAME	ACRONYM	PI AFFILIATION	PRINCIPAL INVESTIGATOR	I&T CONTRACTOR
MULTISPECTRAL SCANNER	MSS	GSFC	G. F. BANKS	HAC/SBRC
THEMATIC MAPPER	TM	GSFC	O. WEINSTEIN	SBRC

Instrument Descriptions

The Landsat 5 Multispectral Scanner (MSS), Data Point 703, was essentially the same instrument which flew on Landsats 1&2 except for the optical system which has to accommodate a lower spacecraft altitude. The MSS includes four multispectral energy bands - two for visible light energy and two for reflected infrared energy. The instrument detectors consist of 24 photosensors. Resolution for all four bands is 80 x 80 meters. Hughes Aircraft Corporation (HAC) is the prime contractor and Santa Barbara Research Center (SBRC) is responsible for development of the basic instrument.

The Landsat 5 Thematic Mapper (TM), Data Point 704, is an upgraded multispectral scanner similar to the MSS but with 2 to 2.5 times as much resolution. The TM has a total of seven energy bands - six for reflected energy and one for radiated thermal infrared energy. The ground resolution for the six reflected energy bands is 30 x 30 meters, while the ground resolution for the thermal energy band is 120 x 120 meters. The TM has a total of 100 detectors - sixteen in each of the reflected energy bands and 4 in the thermal energy band. In addition, the scanning efficiency is twice that of the MSS because the scan mirror accepts data during both sweeps of the mirror compared to only one direction of scan for the MSS.

Launch

7/16/82(4)

3/1/84(5)